



## Emergency ambulance dispatches and apparent temperature: A time series analysis in Emilia-Romagna, Italy

---

**Author(s):** Alessandrini E, Zauli Sajani S, Scotto F, Miglio R, Marchesi S, Lauriola P  
**Year:** 2011  
**Journal:** Environmental Research. 111 (8): 1192-1200

---

### Abstract:

**INTRODUCTION:** Increases in mortality associated with oppressive weather have been widely investigated in several epidemiological studies. However, to properly understand the full public health significance of heat-related health effects, as well as to develop an effective surveillance system, it is also important to investigate the impact of stressful meteorological conditions on non-fatal events. The objective of our study was to evaluate the exposure-response relationship of ambulance dispatch data in association with biometeorological conditions using time series techniques similar to those used in previous studies on mortality. **METHODS:** Daily data of emergency ambulance dispatches for people aged 35 or older in the summer periods from 2002 to 2006 were collected for the major towns in the Emilia-Romagna region. In the first stage of the analysis, the city-specific relationship between daily ambulance dispatches and increasing apparent temperature was explored using Generalized Additive Models while controlling for air pollution, seasonality, long-term trend, holidays and weekends. The relationship between ambulance dispatches and apparent temperature was approximated by linear splines. The effects of high temperatures on health were evaluated for respiratory and cardiovascular diseases as well as for all non-traumatic conditions. In the second stage of the analysis, city-specific effects were combined in fixed or random effect meta-analyses. **RESULTS:** The percent change in the ambulance dispatches associated with every 1 degrees C increase in the mean apparent temperature between 25 and 30 degrees C was 1.45% (95% confidence interval: 0.95, 1.95) for non-traumatic diseases and 2.74% (95% CI: 1.34, 4.14) for respiratory diseases. The percent increase in risk was greater on days in which the mean apparent temperature exceeded 30 degrees C (8.85%, 95% CI: 7.12, 10.58 for non-traumatic diseases). In this interval of biometeorological conditions, cardiovascular diseases became positively associated with the apparent temperature. The risks increased with age. The increase in risk for the non-traumatic diseases reached 13.34% for people aged 75 or older compared to 4.75% for those aged 35-64. **CONCLUSION:** Time series analysis techniques were adopted for the first time to investigate emergency ambulance dispatches to evaluate the risks associated with biometeorological discomfort. Our findings show a strong relationship between biometeorological conditions and ambulance dispatches.

**Source:** <http://dx.doi.org/10.1016/j.envres.2011.07.005>

### Resource Description

#### Exposure : ☐

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature, Other Exposure

# Climate Change and Human Health Literature Portal

**Air Pollution:** Ozone, Particulate Matter, Other Air Pollution

**Air Pollution (other):** NO2

**Temperature:** Fluctuations

**Other Exposure:** apparent temperature

**Geographic Feature:** 

resource focuses on specific type of geography

Urban

**Geographic Location:** 

resource focuses on specific location

Non-United States

**Non-United States:** Europe

**European Region/Country:** European Country

**Other European Country :** Italy

**Health Impact:** 

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Morbidity/Mortality, Respiratory Effect

**Cardiovascular Effect:** Other Cardiovascular Effect

**Cardiovascular Disease (other):** cardiovascular disease morbidity

**Respiratory Effect:** Other Respiratory Effect

**Respiratory Condition (other) :** respiratory disease morbidity

**Population of Concern:** A focus of content

**Population of Concern:** 

populations at particular risk or vulnerability to climate change impacts

Elderly

**Resource Type:** 

format or standard characteristic of resource

Research Article

**Timescale:** 

time period studied

Time Scale Unspecified